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1 [An essential design pattern for fault-tolerant distributed state sharing](#)

Nayeem Islam, Murthy Devarakonda

October 1996 **Communications of the ACM**, Volume 39 Issue 10Full text available: [pdf\(242.40 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

2 [Fault-Tolerant Software for Real-Time Applications](#)

H. Hecht

December 1976 **ACM Computing Surveys (CSUR)**, Volume 8 Issue 4Full text available: [pdf\(1.43 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

3 [Industrial sessions: beyond relational tables: Coordinating backup/recovery and data consistency between database and file systems](#)

Suparna Bhattacharya, C. Mohan, Karen W. Brannon, Inderpal Narang, Hui-I Hsiao, Mahadevan Subramanian

June 2002 **Proceedings of the 2002 ACM SIGMOD international conference on Management of data**Full text available: [pdf\(1.44 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Managing a combined store consisting of database data and file data in a robust and consistent manner is a challenge for database systems and content management systems. In such a hybrid system, images, videos, engineering drawings, etc. are stored as files on a file server while meta-data referencing/indexing such files is created and stored in a relational database to take advantage of efficient search. In this paper we describe solutions for two potentially problematic aspects of such a data ...

Keywords: DB2, content management, database backup, database recovery, datalinks

4 [Computing the performability of layered distributed systems with a management architecture](#)

Olivia Das, C. Murray Woodside

January 2004 **ACM SIGSOFT Software Engineering Notes , Proceedings of the fourth international workshop on Software and performance**, Volume 29 Issue 1Full text available: [pdf\(942.77 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

This paper analyzes the performability of client-server applications that use a separate fault management architecture for monitoring and controlling of the status of the application

software and hardware. The analysis considers the impact of the management components and connections, and their reliability, on performability. The approach combines minpath algorithms, Layered Queueing analysis and non-coherent fault tree analysis techniques for efficient computation of expected reward rate of the ...

Keywords: distributed systems, layered queueing networks, non-coherent fault trees, performability, system fault-tolerance

5 A methodology for fast PC hard disk state restoration

David D. Langan, Thomas J. Scott

March 1992 **Proceedings of the 1992 ACM/SIGAPP symposium on Applied computing: technological challenges of the 1990's**

Full text available:  [pdf\(676.05 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

6 An efficient primary-segmented backup scheme for dependable real-time communication in multihop networks

Krishna Phani Gummadi, Madhavarapu Jnana Pradeep, C. Siva Ram Murthy

February 2003 **IEEE/ACM Transactions on Networking (TON)**, Volume 11 Issue 1

Full text available:  [pdf\(606.18 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Several distributed real-time applications (e.g., medical imaging, air traffic control, and video conferencing) demand hard guarantees on the message delivery latency and the recovery delay from component failures. As these demands cannot be met in traditional datagram services, special schemes have been proposed to provide timely recovery for real-time communications in multihop networks. These schemes reserve additional network resources (spare resources) *a priori* along a backup channel ...

Keywords: backup channel, backup multiplexing, dependable connection, multihop network, primary channel, quality-of-service (QoS), real-time communication, resource reservation protocol (RSVP), segmented backup

7 Fast cluster failover using virtual memory-mapped communication

Yuan Yuan Zhou, Peter M. Chen, Kai Li


May 1999 **Proceedings of the 13th international conference on Supercomputing**

Full text available:  [pdf\(1.45 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

8 High speed on-line backup when using logical log operations

David B. Lomet

May 2000 **ACM SIGMOD Record , Proceedings of the 2000 ACM SIGMOD international conference on Management of data**, Volume 29 Issue 2

Full text available:  [pdf\(220.69 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Media recovery protects a database from failures of the stable medium by maintaining an extra copy of the database, called the backup, and a media recovery log. When a failure occurs, the database is "restored" from the backup, and the media recovery log is used to roll forward the database to the desired time, usually the current time. Backup must be both fast and "on-line", i.e. concurrent with on-going update activity. Conventional online backup sequentially copies ...

9 Abstract models of dialogue concepts

R. Studer

March 1984 **Proceedings of the 7th international conference on Software engineering**

Full text available:  [pdf\(810.63 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We introduce formal, abstract models for specifying modern dialogue concepts offered by dialogue interfaces. The dialogue concepts considered in this paper are menus, forms, and windows. Using these abstract models a totally formal definition of man-machine interactions and screen layouts is achieved. Thus the semantics of user actions can be formalized. The specification method we are using is the Vienna Development Method. Examples are taken from the Application Development and Support Sy ...

10 Management of a remote backup copy for disaster recovery

Richard P. King, Nagui Halim, Hector Garcia-Molina, Christos A. Polyzois

May 1991 **ACM Transactions on Database Systems (TODS)**, Volume 16 Issue 2

Full text available:  [pdf\(2.48 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

A remote backup database system tracks the state of a primary system, taking over transaction processing when disaster hits the primary site. The primary and backup sites are physically isolated so that failures at one site are unlikely to propagate to the other. For correctness, the execution schedule at the backup must be equivalent to that at the primary. When the primary and backup sites contain a single processor, it is easy to achieve this property. However, this is harder to do when ...

Keywords: database initialization, hot spare, hot standby, remote backup

11 A NonStop kernel

Joel F. Bartlett

December 1981 **Proceedings of the eighth ACM symposium on Operating systems principles**

Full text available:  [pdf\(757.37 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The Tandem NonStop System is a fault-tolerant [1], expandable, and distributed computer system designed expressly for online transaction processing. This paper describes the key primitives of the kernel of the operating system. The first section describes the basic hardware building blocks and introduces their software analogs: processes and messages. Using these primitives, a mechanism that allows fault-tolerant resource access, the process-pair, is described. The paper concludes with some ...

12 Process backup in producer-consumer systems

David L. Russell

November 1977 **Proceedings of the sixth ACM symposium on Operating systems principles**

Full text available:  [pdf\(613.51 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

System state restoration after detection of an error is discussed for producer-consumer systems, with emphasis on the control of the domino effect. Recovery primitives MARK, RESTORE, and PURGE are proposed that, in conjunction with the use of SEND-RECEIVE interprocess communication primitives, allow bounds to be placed on the amount of unnecessary restoration that can occur as a result of system state restoration.

Keywords: Asynchronous programming, Domino effect, Error recovery, Interprocess communication, Message facilities, Software fault tolerance, State restoration

13 System support for partition-aware network applications

Özalp Babaoğlu, Renzo Davoli, Alberto Montresor, Roberto Segala

January 1998 **ACM SIGOPS Operating Systems Review**, Volume 32 Issue 1

Full text available:  [pdf\(1.33 MB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Network applications and services need to be *environment-aware* in order to meet quality-of-service requirements in an increasingly dynamic world. In this paper we consider *partition awareness* as an instance of environment awareness in network applications that need to be reliable and self-managing. Partition-aware applications dynamically reconfigure themselves and adjust the quality of their services in response to network partitions and merges. As such, they can automatically ada ...

14 An execution model for distributed object-oriented computation

Edward H. Bensley, Thomas J. Brando, Myra Jean Prella

January 1988 **ACM SIGPLAN Notices , Conference proceedings on Object-oriented programming systems, languages and applications**, Volume 23 Issue 11

Full text available:  [pdf\(736.18 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper describes an execution model being developed for distributed object-oriented in a message-passing multiple-instruction/multiple-data-stream (MIMD) environment. The objective is to execute an object-oriented program as concurrently as possible. Some opportunities for concurrency can be identified explicitly by the programmer. Others can be identified at compile time. There are some opportunities for concurrency, however, that can only be discovered at runtime because they are data ...

15 A reusable lightweight executive for command and control systems

Nathan Fleener, Laura Moody, Mary Stewart

November 1998 **ACM SIGAda Ada Letters , Proceedings of the 1998 annual ACM SIGAda international conference on Ada**, Volume XVIII Issue 6

Full text available:  [pdf\(676.14 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

Keywords: Ada, executive, portability

16 Replication in the harp file system

Barbara Liskov, Sanjay Ghemawat, Robert Gruber, Paul Johnson, Liuba Shrira

September 1991 **ACM SIGOPS Operating Systems Review , Proceedings of the thirteenth ACM symposium on Operating systems principles**, Volume 25 Issue 5

Full text available:  [pdf\(1.60 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

17 Towards a fault-tolerant multi-agent system architecture

Sanjeev Kumar, Philip R. Cohen

June 2000 **Proceedings of the fourth international conference on Autonomous agents**

Full text available:  [pdf\(969.71 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: autonomy, fault-tolerance, multi-agent systems, teamwork

18 Computer assisted application definition

Martin Mikelsons

January 1975 **Proceedings of the 2nd ACM SIGACT-SIGPLAN symposium on Principles of programming languages**

Full text available:  [pdf\(875.01 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

This paper describes a system being developed to bridge the gap between an application program and a user inexperienced in the ways of computers. The user explores the characteristics of the available programs by a natural language dialogue with the system.

The dialogue is supported by a knowledge base covering both the program semantics and the application domain. This paper addresses the problems of representation and inference involved in this approach and describes our solution for them.

19 Replication and fault-tolerance in the ISIS system

Kenneth P. Birman

December 1985 **ACM SIGOPS Operating Systems Review , Proceedings of the tenth ACM symposium on Operating systems principles**, Volume 19 Issue 5

Full text available:  pdf(716.75 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



20 The first embedded distributed Ada95 application

Patrick Rogers, Marc Pitarys

November 1995 **Proceedings of the conference on TRI-Ada '95: Ada's role in global markets: solutions for a changing complex world**

Full text available:  pdf(1.22 MB) Additional Information: [full citation](#), [references](#), [citations](#)



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